BS EN 50523-2:2009

BSI British Standards

Household appliances interworking —

Part 2: Data structures

National foreword

This British Standard is the UK implementation of EN 50523-2:2009.

The UK participation in its preparation was entrusted to Technical Committee CPL/59, Performance of household electrical appliances.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

ISBN 978 0 580 64067 4

ICS 97.120

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 July 2009

Amendments issued since publication

Amd. No.	Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50523-2

July 2009

ICS 97.120

English version

Household appliances interworking - Part 2: Data structures

Interfonctionnement des appareils électrodomestiques - Partie 2: Structures des données

Geräte für den Hausgebrauch - Interworking - Teil 2: Datenstrukturen

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

Foreword

This European Standard was prepared by the WG 7 of Technical Committee CENELEC TC 59X, Consumer information related to household electrical appliances.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50523-2 on 2009-06-01.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2010-06-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2012-06-01

The Working Group CLC/TC 59X/WG 7, Smart house, was initiated by CECED and installed by the decision of the CLC/TC 59 meeting on 2004-09-14/15.

This Part 2 of EN 50523 defines the message data structures used for communication between household appliances. This part is to be read in conjunction with Part 1 “Functional specification” of this standard. Part 1 defines the interoperability requirements for installation, control and monitoring of household appliances.

_____

Contents

Tables

1 Scope

This European Standard specifies the message Data structures used for communication between devices that comply with the Household Appliances Interworking standard. It is a companion document to EN 50523-1, Functional specification.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50523-1, *Household appliances interworking – Part 1: Functional specification*

3 Terms, definitions and abbreviations

For the purposes of this document, the terms, definitions and abbreviations given in EN 50523-1 apply.

4 Conventions for format

- Byte I is the I-th transmitted byte of the data field. To ease direct reading of data field, big endian is used.

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4

- If word fields consisting of two bytes are used then, the most significant byte is the first field.

Word	
Byte M	Byte M+1
Most significant byte	Least significant byte

- The format used for signed integer is 2's complement.

- The character set used for a string (array of characters terminated with a null character) is ASCII.

5 Functional Blocks Mapping

5.1 EXECUTE COMMAND

The table below defines the data structures used for all MIDs of the Functional Block EXECUTE COMMAND.

Table 1 – EXECUTE COMMAND MIDs

MID	Data
Execution of a Command	**Byte 0: Command Identification** Value 0 is reserved. Values ranging from 1 to 63 are standardised commands. START 1 STOP 2 PAUSE 3 START SUPERFREEZING 4 STOP SUPERFREEZING 5 START SUPERCOOLING 6 STOP SUPERCOOLING 7 DISABLE GAS 8 ENABLE GAS 9 START SUPERHEATING 10 STOP SUPERHEATING 11 Values ranging from 63 to 127 are non-standardised commands. Values ranging from 128 to 255 are proprietary commands.
Washing Parameters	**Byte 0: Type of Programme Data** Value 0 is reserved. Values ranging from 1 to 63 are standardised types. Values ranging from 64 to 127 are non-standardised types. Values ranging from 128 to 255 are proprietary types. **Other bytes: programme data**
Cooking Parameters	See Washing Parameters above
Refrigeration Parameters	See Washing Parameters above
Air Conditioning Parameters	See Washing Parameters above
Water Heating Parameters	See Washing Parameters above
Start Time	**Byte 0** **Bit 0-5:** Minutes ranging from 0 to 59 **Bit 6-7:** RELATIVE 0 ABSOLUTE 1 Reserved 2 Reserved 3 **If RELATIVE** **Byte 1:** Hours ranging from 0 to 255 **If ABSOLUTE** **Byte 1:** Hours ranging from 0 to 23 The value 0xFFFF as well as all invalid absolute values means **Not available.**
Finish Time	See Start Time above
Set Temperature	**Byte 0:** Most significant byte of 2 bytes signed integer providing value ranging from -50 °C to +500 °C. Precision is 1 °C. **Byte 1:** Least significant byte of 2 bytes signed integer providing value ranging from -50 °C to +500 °C. Precision is 1 °C.
Reduction	**Byte 0:** Values ranging from 0 to 63 are standardised reduction levels. 0: Normal info & alerts 1: All alerts 2: Alerts (Fault & Dangerous category) 3: Alerts (Fault category) Values ranging from 64 to 127 are non-standardised. Values ranging from 128 to 255 are proprietary.

5.2 SIGNAL STATE

The table below defines the data structures used for all MIDs of the Functional Block SIGNAL STATE.

Table 2 – SIGNAL STATE MIDs

MID	Data
Device Status	**Byte 0: Device Status** Value 0 is reserved Values ranging from 1 to 63 are standardised. OFF 1 STAND-BY 2 PROGRAMMED 3 PROGRAMMED WAITING TO START 4 RUNNING 5 PAUSE 6 END PROGRAMMED 7 FAILURE 8 PROGRAMME INTERRUPTED 9 IDLE 10 RINSE HOLD 11 SERVICE 12 SUPERFREEZING 13 SUPERCOOLING 14 SUPERHEATING 15 Values ranging from 64 to 127 are non-standardised. Values ranging from 128 to 255 are proprietary. **Byte 1** **Bit 0-3: Remote Enable Flags** Remote Control is **DISABLED** **0** Remote Control is enabled in general, but **TEMPORARILY LOCKED**/DISABLED 7 Remote Control is **ENABLED** **F** Other values are reserved for future extensions **Bit 4-7: Device Status 2 Structure** PROPRIETARY 0 PROPRIETARY 1 IRIS SYMPTOM CODE 2 RESERVED 3 to 15 **Other bytes: Device Status 2** Non-standardised or Proprietary data. In the case of IRIS Symptom Code, 3 bytes representing the 3 digit encoding (see [1]) possibly complemented with proprietary bytes.
Remaining Time	**Byte 0:** Minutes ranging from 0 to 59 **Byte 1:** Hours ranging from 0 to 23
Washing Parameters	See EXECUTE COMMAND
Cooking Parameters	See EXECUTE COMMAND
Refrigeration Parameters	See EXECUTE COMMAND

Table 2 – SIGNAL STATE MIDs *(continued)*

MID	Data
Air Conditioning Parameters	See EXECUTE COMMAND
Water Heating Parameters	See EXECUTE COMMAND
Start Time	See EXECUTE COMMAND
Finish Time	See EXECUTE COMMAND
Current phase	**Byte 0:** PROPRIETARY 1 **Other bytes:** Non-standardised or proprietary
Set Temperature	See EXECUTE COMMAND
Displayed Temperature	See Set Temperature above
Current Temperature	See Set Temperature above
Reduction	See EXECUTE COMMAND

5.3 SIGNAL EVENT

The table below defines the data structures used for all MIDs of the Functional Block SIGNAL EVENT.

Table 3 – SIGNAL EVENT MIDs

MID	Data
Application Error	**Byte 0**: **Error code** Command Refused 1 Invalid OID 2 Invalid Operation 3 Invalid Field 4 Reserved 5 Invalid Data 6 Invalid Transition 7 Values ranging from 64 to 127 are non-standardised. Values ranging from 128 to 255 are proprietary. **Byte 1-2: OID used in the failed operation** **Byte 3: Operation causing the failure** CHANGE 1 GET 2 RETURN 3 SEND 4
Normal Event	**Byte 0:** Reserved field set to 0 **Byte 1:** Values ranging from 0 to 63 are standardised. END_OF_CYCLE 1 Reserved 2 Reserved 3 TEMPERATURE_REACHED 4 END_OF_COOKING 5 SWITCHING OFF 6 Values ranging from 64 to 127 are non-standardised. Values ranging from 128 to 255 are proprietary, except from value 0xF7. WRONG_DATA 0xF7 For non-standardised or proprietary values (greater or equal to 64) up to four additional bytes can be added to the basic two for non-standardised or proprietary use.

Table 3 – SIGNAL EVENT MIDs *(continued)*

MID	Data
Alert Events	**Byte 0** **Bit 0-3: number of events N** **Bit 4-7: type of event** Unstructured [a] 0 **Sequence of 3 bytes** **Byte i: event id** Value 0 is reserved. Values ranging from 1 to 63 are standardised. Values ranging from 64 to 127 are non-standardised. Values ranging from 128 to 255 are proprietary. **Byte i+1** **Bit 0-3: category** WARNING 1 DANGER 2 FAILURE 3 **Bit 4-5: presence recovery** PRESENCE 0 RECOVERY 1 **Bit 6-7: reserved set to 0** **Byte i+2: non-standardised or proprietary**
Reduction	See EXECUTE COMMAND
Device Status	See SIGNAL STATE
Remaining Time	See SIGNAL STATE
Washing Parameters	See SIGNAL STATE
Cooking Parameters	See SIGNAL STATE
Refrigeration Parameters	See SIGNAL STATE
Air Conditioning Parameters	See SIGNAL STATE
Water Heating Parameters	See SIGNAL STATE
Start Time	See SIGNAL STATE
Finish Time	See SIGNAL STATE
Current phase	See SIGNAL STATE
Set Temperature	See SIGNAL STATE
Displayed Temperature	See SIGNAL STATE
Current Temperature	See SIGNAL STATE
[a] It is anticipated that in the future Alert Event values will be further structured. This field will serve to identify other set of values.	

Here is an example of a list of two alert events in one MID.

EXAMPLE Example of a list of two alert events.

- Alert event 128 is of WARNING category, its presence has been detected.
- Alert event 150 is of DANGER category, it has been recovered.

Byte 0		**Byte 1**	**Byte 2**			**Byte 3**	**Byte 3**	**Byte 4**			**Byte 5**
4-7	0-3	0-7	6-7	4-5	0-3	0-7	0-7	6-7	4-5	0-3	0-7
Type of event	Number of event	Event id	-	P/R	Category	Proprietary	Event id	-	P/R	Category	Proprietary
0	2	128	0	0	1	xx	150	0	1	2	Xx

5.4 IDENTIFY PRODUCT

The table below defines the data structures used for all MIDs of the Functional Block IDENTIFY PRODUCT.

Table 4 – IDENTIFY PRODUCT MIDs

MID	**Field**	**Field Id** (Hex)	**Data Structure**
Extended Identification Request	Company name	1	Up to 16 char string decided by manufacturer
	Company id	2	2 bytes
	Brand name	3	Up to 16 char string decided by manufacturer
	Brand id	4	2 bytes
	Model	5	Up to 16 char string decided by manufacturer
	Part number	6	Up to 16 char string decided by manufacturer
	Product revision	7	Up to 6 char string decided by manufacturer
	Software revision	8	Up to 6 char string decided by manufacturer
	Product type name	9	2 characters. See Table 6.
	Product type id	A	2 bytes. See Table 6.
	Standard Version	B	1 byte. See Table 8.
		C to 1F	Reserved
	Non-standardised	20 to 80	Non-standardised data
	Proprietary	80 to FF	Proprietary data
Basic Identification Request	**Byte 0 and Byte 1: Company Id** **Byte 2 and Byte 3: Brand Id** **Byte 4 and Byte 5: Product type Id** **Byte 6: Standard version**		

Table 5 – Company Ids and Brand Ids

Company Name	Company Id	Brand Name [a]	Brand Id
Arcelik	"A" + "R"	Arcelik	“A” + “1”
		Beko	"B" + "1"
		Blomberg	"B" + "2"
		Electra Bregenz	"E" + "1"
		Ardem	“A” + “2”
		Altus	"A" + "3"
		Demrad	"D" + "1"
BSH	“B” + “S”	Siemens	“S” + “1”
		Bosch	“B” + “1”
		Balay	"B" + "3"
		Constructa	"C" + "1"
		Continental	"C" + "2"
		Coldex	"C" + "4"
		Corcho	"C" + "8"
		Gaggenau	"G" + "1"
		Lynx	"L" + "4"
		Metalfrio	“M” + “1”
		Neff	"N" + "1"
		Pitsos	"P" + "1"
		Profilo	"P" + "3"
		Protos	"P" + "5"
		Junker&Ruh	"R" + "5"
		Superser	"S" + "5"
		Thermador	"T" + "1"
		Ufesa	"U" + "1"
Candy	“C” + “A”	Candy	“C” + “1”
		Hoover	“H” + “1”
		Rosières	"R"+"1"
		Iberna	"I"+"1"
		Zerowatt	"Z"+"1"
		Otsein	"O"+"1"
		Zerowatt Hoover	"Z"+"2"
		Otsein Hoover	"O"+"2"
		“trio”	"T"+"1"
CLAGE	“C” + “L”	CLAGE	“C” + “L”
Electrolux	“E” + “L”	AEG	“A” + “1”
		Allwyn	“A” + “2”
		Arthur Martin Electrolux	“A” + “3”
		Corberó	“C” + “1”
		Elektro Helios	“E” + “1”
		Electrolux	“E” + “2”
		Faure	“F” + “1”
		Frigidaire	“F” + “2”
		Husqvarna	“H” + “1”
		Kelvinator	“K” + “1”
		Electrolux Maxclean	“M” + “1”
		Rex	“R” + “1”
		Rosenlew	“R” + “2”
		Samus	“S” + “1”
		Voss	“V” + “1”
		White Westinghouse	“W” + “1”
		Zanker Electrolux	“Z” + “1”
		Zanker	“Z” + “2”
		Zanussi	“Z” + “3”
		Zanussi-Samus	“Z” + “4”

Table 5 – Company Ids and Brand Ids *(continued)*

Company Name	Company Id	Brand Name [a]	Brand Id
ElcoBrandt	"E" + "B"	Brandt De Dietrich Ocean Samet San Giorgio Sauter Thomson Vedette	"B"+"R" "D"+"D" "O"+"C" "S"+"M" "S"+"G" "S"+"U" "T"+"H" "V"+"E"
Fagor	"F" + "A"	Fagor Aspes Edesa	"F"+"1" "A"+"1" "E"+"1"
Liebherr	"L" + "H"	Liebherr	"L" + "H"
Gorenje	"G" + "O"	Gorenje Sidex Körting Galant Pacific Pacific by Gorenje Gorenje Pininfarina	"G"+"G“ "G"+"S" "G"+"K" "G"+"A" "G"+"C" "G"+"Y“ "G"+"P"
Indesit Company	"I" + "C"	Ariston Indesit Scholtes Stinol	"A" + "R" "I" + "N" "S" + "C" "S" + "T"
Miele	“M” + “I”	Miele	“M” + “I”
V-ZUG AG	“V” + “Z”	ZUG Gehrig Sibir	"Z" + "G" "G"+"G" "S"+"I"
Whirlpool	“W” + “H”	Whirlpool Bauknecht Ignis Laden	"W" + "H" "B" + "K" "I" + "G" "L" + "D"
[a] Brand ID and Brand Name should be filled in by the corresponding companies. This way, companies can use identifiers which they are already using (at least if they are 2 bytes long).			

Note that Brand Ids and Company Ids are independently defined. The advantage is that one brand of one producer may have the same id as a brand name of another producer.

Product type Ids are defined as 2-byte fields which are structured as follows:

- a cluster field (3 LSB of most significant byte). The following Hex values are defined (other values are reserved):
  - 3: general to all clusters;
  - 6: household appliance;

- a category type (5 MSB of most significant byte). The following Hex values are defined (other values are reserved):
  - 1: general household appliance;
  - 2: ventilation;
  - A: wet;
  - B: hot;
  - C: cold;
  - D: heat;

- an Id (least significant byte). A Hex value ranging from 00 to 31 is recommended for the time being. Other values are reserved for the future.

Table 6 – Product Names and Product Types

Appliance	Product Name	Cluster	Category (Hex)	Id (Hex)	Product Type Id (Hex)
Combi	CB	6	General: 1	00	0E00
Air Conditioner	AC	6	Ventilation: 2	03	1603
Dishwasher	DW	6	Wet: A	01	5601
Tumble Dryer	TD	6	Wet: A	02	5602
Washer Dryer	WD	6	Wet: A	03	5603
Washing Machine	WM	6	Wet: A	04	5604
Gas Oven	GO	6	Hot: B	01	5E01
Gas Cook top	GT	6	Hot: B	02	5E02
Hobs	HB	6	Hot: B	03	5E03
Hood	HD	6	Hot: B	04	5E04
Microwave Oven	MW	6	Hot: B	05	5E05
Electrical Oven	OV	6	Hot: B	06	5E06
Range cooker	RG	6	Hot: B	07	5E07
Steam Oven	ST	6	Hot: B	08	5E08
Induction Hobs	IH	6	Hot: B	09	5E09
Refrigerator Freezer	FR	6	Cold: C	01	6601
Freezer	FZ	6	Cold: C	02	6602
Refrigerator	RE	6	Cold: C	03	6603
Winecabinet	WC	6	Cold: C	04	6604
Instantaneous Water Heater	WHI	6	Heat: D	01	6E01
Storage Water Heater	WHS	6	Heat: D	02	6E02

OIDs are described by the following field:

- an OID identification This is a Hex value ranging from 80 to BF.

Optionally, it is possible to describe OIDs as the combination of the following three fields:

- a cluster field with a Hex value ranging from 0 to 7:
  - 3: common to all clusters;
  - 6: household cluster;
- a category type with a Hex value ranging from 0 to F:
  - 1: general household appliance;
  - 2: ventilation;
  - A: wet;
  - B: hot;
  - C: cold;
  - D: heat;
- an OID identification with a Hex value ranging from 80 to BF.

This is an option because the cluster field and category type field are redundant. All OID Ids are different, independently of the cluster and category involved (i.e. it is not possible to have the same OID Ids for two OIDs from a different cluster/category).

Table 7 – OID Encodings

OID	Cluster	Category (Hex)	Id (Hex)
Execution of a command	6	General: 1	80
Washing Parameters	6	Wet: A	81
Cooking Parameters	6	Hot: B	81
Refrigeration Parameters	6	Cold: C	81
Air Conditioning Parameters	6	Ventilation: 2	81
Water Heating Parameters	6	Heat: D	81
Start Time	6	General: 1	82
Finish Time	6	General: 1	83
Device Status	6	General: 1	84
Remaining Time	6	General: 1	D2
Current Phase	6	General: 1	85
Set Temperature	6	General: 1	87
Displayed Temperature	6	General: 1	88
Current Temperature	6	General: 1	89
Normal Events	6	General: 1	8A
Alert Events	6	General: 1	86
Reduction	6	General: 1	8B
Extended Identification Request	6	General: 1	8C
Basic Identification Request	6	General: 1	8D
Diagnosis Operation	6	General: 1	8E
Diagnosis Data	6	General: 1	8F
Time	3	General: 1	C0
Date	3	General: 1	C1
New Standardised OIDS	6	-	90 to AF
Proprietary OID	6	-	B0 to BF

Table 8 – Standard Version

Standard Version	Value (Hex)
Compliant with v1.0, not certified	10
Compliant with v1.0 certified	1A
Compliant with vX.0, not certified	X0
Compliant with vX.0 certified	XA
Other Values	Reserved

5.5 COLLECT DIAGNOSIS DATA

The table below defines the data structures used for all MIDs of the Functional Block COLLECT DIAGNOSIS DATA.

Table 9 – COLLECT DIAGNOSIS MIDs

MID	Data
Diagnosis Operation	**Byte 0:** PROPRIETARY 1 **Other bytes :** Non-standardised or Proprietary
Diagnosis Data	**Byte 0:** PROPRIETARY 1 **Other bytes:** Non-standardised or Proprietary

5.6 MANAGE TIME

The table below defines the data structures used for all MIDs of the Functional Block MANAGE TIME.

Table 10 – MANAGE TIME MIDs

MID	Data
Time	**Byte 0:** Seconds ranging from (decimal value) 0 to 59 **Byte 1:** Minutes ranging from (decimal value) 0 to 59 **Byte 2** **Bit 0-4:** Hours ranging from (decimal value) 0 to 23 **Bit 5-7:** 0: no day value 1: Monday 2: Tuesday 3: Wednesday 4: Thursday 5: Friday 6: Saturday 7: Sunday
Date	**Byte 0:** Year value ranging from (decimal value) 0 (2000) to xyz (2xyz) **Byte 1:** Month value ranging from (decimal value) 1 to 12 **Byte 2:** Day value ranging from (decimal value) 1 to 31

Bibliography

[1] Standard for Repair Coding and Guarantee Claim Form. CECED Standard, September 2001

This page deliberately left blank

British Standards Institution (BSI)

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level.

It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover.

Tel: +44 (0)20 8996 9000 Fax: +44 (0)20 8996 7400

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to BSI Customer Services.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001
Email: orders@bsigroup.com

You may also buy directly using a debit/credit card from the BSI Shop on the website **www.bsigroup.com/shop**

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library.

Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre.

Tel: +44 (0)20 8996 7111
Fax: +44 (0)20 8996 7048 Email: info@bsigroup.com

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration.

Tel: +44 (0)20 8996 7002 Fax: +44 (0)20 8996 7001
Email: membership@bsigroup.com

Information regarding online access to British Standards via British Standards Online can be found at **www.bsigroup.com/BSOL**

Further information about BSI is available on the BSI website at **www.bsigroup.com**

Copyright

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Tel +44 (0)20 8996 9001
Fax +44 (0)20 8996 7001
www.bsigroup.com/standards

raising standards worldwide™

BSI
British Standards